AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

What is claimed is:

1. (Previously presented) A method for routing traffic from a source to a routing destination in a network where a plurality of routes are available, comprising:

assigning a cost to each of said routes and selecting the route with the lowest cost as defined by a cost function, wherein said cost is a function of a path characteristic over the route to which said cost is assigned;

for at least one route, determining the location of said routing destination and inferring said path characteristic based on measurement of said path characteristic associated with sending traffic from said source to another destination over said available routes, wherein the location of said routing destination is determined by circular intersection by:

measuring the time it takes for traffic to move from a plurality of source locations to said routing destination;

converting said times to distance equivalents;

forming a plurality of intersecting circles using said distance equivalents as the radius of circles with said source locations as the center; and

determining the physical location of said routing destination from the intersection of said circles.

2. (Original) method as recited in claim 1, further comprising: propagating the selected route to a router.

3. (Original) A method as recited in claim 2, further comprising:

causing the router to route traffic from said source to said routing destination over said selected route.

4. (Cancelled)

5. (Previously presented) A method as recited in claim 1, wherein said path characteristic is selected from the group consisting of latency, packet loss, headroom, price, path length, Route-Change, and BGP reachability.

6. (Cancelled)

7. (Cancelled)

8. (Previously presented) A method as recited in claim 1, further comprising inferring said path characteristic by determining a weighted average of

said path characteristic from said source to other destinations based on physical proximity of said other destinations to said routing destination.

9. (Original) A method as recited in claim 1, further comprising:

measuring latency between said source and a plurality of other destinations;

determining physical distances between said routing destination and said other destinations;

computing a weighted average of said latency measurements as a function of said distances; and

using said weighted average as an estimate of the latency between said source and said routing destination.

10. (Currently Amended) A method for routing traffic from a source to a routing destination in a network where a plurality of routes are available, comprising:

~~for each available route~~,

~~(i) obtaining~~ a measurement of a path characteristic associated with routing traffic from said source to said routing destination for a first route; ~~or~~and

~~(ii) determining~~ the location of said routing destination and inferring said path characteristic for a second route based on measurement of said path characteristic associated with sending traffic from said source to another destination, ~~over said available routes;~~ wherein the location of said routing destination is determined by circular intersection by:

measuring the time that it takes for traffic to move from a plurality of source locations to said routing destination;

converting said times to distance equivalents; and

forming a plurality of intersecting circles using said distance equivalents as the radius of circles with said source locations as the center;

using a cost function, assigning a cost to each available route as a function of the path characteristic associated with said route;

minimizing said cost function over said available routes; and

routing said traffic according to the lowest cost route determined by minimizing said cost function.

11. (Original) method as recited in claim 10, further comprising: propagating said lowest cost route to a router.

12. (Original) A method as recited in claim 11, further comprising:

causing the router to route traffic from said source to said routing destination over said lowest cost route.

13. (Original) A method as recited in claim 10, wherein said path characteristic is selected from the group consisting of latency, packet loss, headroom, price, path length, Route-Change, and BGP reachability.

14. (Cancelled)

15. (Cancelled)

16. (Previously presented) A method as recited in claim 10, further comprising inferring said path characteristic by determining a weighted average of said path characteristic from said source to other destinations based on physical proximity of said other destinations to said routing destination.

17. (Original) A method as recited in claim 10, further comprising:

measuring latency between said source and a plurality of other destinations;

determining physical distances between said routing destination and said other destinations;

computing a weighted average of said latency measurements as a function of said distances; and

using said weighted average as an estimate of the latency between said source and said routing destination.

18. (Currently Amended) A method for routing traffic from a source to a routing destination in a network where a plurality of routes are available, comprising:

~~for each available route,~~

~~(i)~~ obtaining a measurement of a path characteristic associated with routing traffic from said source to said routing destination for a first route; ~~or~~ and

~~(ii)~~ determining the location of said routing destination and inferring said path characteristic for a second route based on measurement of said path characteristic associated with sending traffic from said source to another destination, ~~over said available routes;~~ wherein the location of said routing destination is determined by circular intersection by:

measuring the time that it takes for traffic to move from a plurality of source locations to said routing destination;

converting said times to distance equivalents; and

forming a plurality of intersecting circles using said distance equivalents as the radius of circles with said source locations as the center; and

determining the physical location of said routing destination from the intersection of said circles.;

using a cost function, assigning a cost to each available route as a function of the path characteristic associated with said route;

selecting the route with the lowest cost as defined by said cost function; and

routing said traffic according to the lowest cost route.

19. (Original) A method as recited in claim 18, further comprising: propagating said lowest cost route to a router.

20. (Original) A method as recited in claim 19, further comprising:

causing the router to route traffic from said source to said routing destination over said lowest cost route.

21. (Original) A method as recited in claim 18, wherein said path characteristic is selected from the group consisting of latency, packet loss, headroom, price, path length, Route-Change, and BGP reachability.

22. (Cancelled)

23. (Cancelled)

24. (Previously presented) A method as recited in claim 18, further comprising inferring said path characteristic by determining a weighted average of said path characteristic from said source to other destinations based on physical proximity of said other destinations to said routing destination.

25. (Original) A method as recited in claim 18, further comprising:

measuring latency between said source and a plurality of other destinations;

determining physical distances between said routing destination and said other destinations;

computing a weighted average of said latency measurements as a function of said distances; and

using said weighted average as an estimate of the latency between said source and said routing destination.

26. (Currently Amended) A method for routing traffic from a source to a routing destination in a network where a plurality of routes are available, comprising:

~~for each available route~~,

~~(i)~~ obtaining a measurement of a path characteristic associated with routing traffic from said source to said routing destination for a first route; ~~or~~and

~~(ii)~~ inferring said path characteristic for a second route based on measurement of said path characteristic associated with sending traffic from said source to another destination, ~~over said available routes,~~ wherein the location of said routing destination is determined by circular intersection by:

measuring the time that it takes for traffic to move from a plurality of source locations to said routing destination;

converting said times to distance equivalents;

forming a plurality of intersecting circles using said distance equivalents as the radius of circles with said source locations as the center; and

determining the physical location of said routing destination from the intersection of said circles;

using a cost function, assigning a cost to each available route as a function of the path characteristic associated with said route;

minimizing said cost function over said routes and identifying a route with the lowest cost of routing said traffic as defined by said cost function; and

generating a routing table containing said lowest cost route.

27. (Original) A method as recited in claim 26, further comprising:

propagating the routing table to a router.

28. (Original) A method as recited in claim 27, further comprising: causing the router to apply said routing table to said routes.

29. (Original) A method as recited in claim 26, wherein said path characteristic is selected from the group consisting of latency, packet loss, headroom, price, path length, Route-Change, and BGP reachability.

30. (Cancelled)

31. (Cancelled)

32. (Currently Amended) A method as recited in claim 26, further comprising inferring said path characteristic by determining a weighted average of

said path characteristic from said source to other destinations based on physical proximity of said other destinations to said routing destination.

33. (Original) A method as recited in claim 26, further comprising:

measuring latency between said source and a plurality of other destinations; determining physical distances between said routing destination and said other destinations;

computing a weighted average of said latency measurements as a function of said distances; and

using said weighted average as an estimate of the latency between said source and said routing destination.

34. (Previously presented) A computer-readable medium comprising computer-executable instructions for:

assigning a cost to each routes from a source to a routing destination in a network where a plurality of routes are available, wherein said cost is a function of a path characteristic over the route, and selecting the route with the lowest cost as defined by a cost function, wherein assigning a cost to each of said routes comprises:

determining the location of said routing destination and inferring said path characteristic based on measurement of said path characteristic associated with sending traffic from said source to another destination over said available routes, wherein determining the location of said routing destination comprises:

measuring the time that it takes for traffic to move from a plurality of source locations to said routing destination;

converting said times to distance equivalents;

forming a plurality of intersecting circles using said distance equivalents as the radius of circles with said source locations as the center; and

determining the physical location of said routing destination from the intersection of said circles.

35. (Previously presented) A computer-readable medium as recited in claim 34, further comprising computer-executable instructions for propagating the selected route to a router.

36. (Previously presented) A computer-readable medium as recited in claim 35, further comprising computer-executable instructions for causing the router to route traffic from said source to said routing destination over said selected route.

37. (Cancelled)

38. (Currently Amended) A computer-readable medium as recited in claim ~~37~~ 34 wherein said path characteristic is selected from the group consisting of latency, packet loss, headroom, price, path length, Route-Change, and BGP reachability.

39. (Cancelled)

40. (Cancelled)

41. (Previously presented) A computer-readable medium as recited in claim 34, further comprising computer-executable instructions for inferring said path characteristic by determining a weighted average of said path characteristic from said source to other destinations based on physical proximity of said other destinations to said routing destination.

42. (Previously presented) A computer-readable medium as recited in claim 34, further comprising computer-executable instructions for:

measuring latency between said source and a plurality of other destinations;

determining physical distances between said routing destination and said other destinations;

computing a weighted average of said latency measurements as a function of said distances; and

using said weighted average as an estimate of the latency between said source and said routing destination.

43. (Currently Amended) A computer-readable medium ~~comprising~~ including computer-executable instructions for routing traffic from a source to a

routing destination in a network where a plurality of routes are available, wherein the instructions comprise:

~~for each available route from a source to a routing destination in a network where a plurality of routes are available,~~

~~(i)~~ obtaining a measurement of a path characteristic associated with routing traffic from said source to said routing destination for a first route; ~~or~~and

~~(ii)~~ determining the location of said routing destination and inferring said path characteristic for a second route based on measurement of said path characteristic associated with sending traffic from said source to another destination ~~over said available routes~~ by:

measuring the time that it takes for traffic to move from a plurality of source locations to said routing destination;

converting said times to distance equivalents;

forming a plurality of intersecting circles using said distance equivalents as the radius of circles with said source locations as the center; and

determining the physical location of said routing destination from the intersection of said circles;

using a cost function, assigning a cost to each available route as a function of the path characteristic associated with said route;

minimizing said cost function over said available routes; and

routing said traffic according to the lowest cost route determined by minimizing said cost function.

44. (Previously presented) A computer-readable medium as recited in claim 43, further comprising computer-executable instructions for propagating said lowest cost route to a router.

45. (Previously presented) A computer-readable medium as recited in claim 44, further comprising computer-executable instructions for causing the router to route traffic from said source to said routing destination over said lowest cost route.

46. (Previously presented) A computer-readable medium as recited in claim 43, wherein said path characteristic is selected from the group consisting of latency, packet loss, headroom, price, path length, Route-Change, and BGP reachability.

47. (Cancelled)

48. (Cancelled)

49. (Previously presented) A computer-readable medium as recited in claim 43, further comprising computer-executable instructions for inferring said path characteristic by determining a weighted average of said path characteristic from said source to other destinations based on physical proximity of said other destinations to routing destination.

50. (Previously presented) A computer-readable medium as recited in claim 43, further comprising computer-executable instructions for:

measuring latency between said source and a plurality of other destinations;

determining physical distances between said routing destination and said other destinations;

computing a weighted average of said latency measurements as a function of said distances; and

using said weighted average as an estimate of the latency between said source and said routing destination.

51. (Currently Amended) A computer-readable medium ~~comprising~~ including computer-executable instructions for: routing traffic from a source to a routing destination in a network where a plurality of routes are available, wherein the instructions comprise:

~~for each available route from a source to a routing destination in a network where a plurality of routes are available;~~

~~(i)~~ obtaining a measurement of a path characteristic associated with routing traffic from said source to said routing destination for a first path; ~~or~~and

~~(ii)~~ determining the location of said routing destination and inferring said path characteristic for a second route based on measurement of said path characteristic associated with sending traffic from said source to another destination ~~over said available routes~~ by:

measuring the time that it takes for traffic to move from a plurality of source locations to said routing destination;

converting said times to distance equivalents;

forming a plurality of intersecting circles using said distance equivalents as the radius of circles with said source locations as the center; and

determining the physical location of said routing destination from the intersection of said circles;

using a cost function, assigning a cost to each available route as a function of the path characteristic associated with said route;

selecting the route with the lowest cost as defined by said cost function; and

routing said traffic according to the lowest cost route.

52. (Previously presented) A computer-readable medium as recited in claim 51, further comprising computer-executable instructions for propagating said lowest cost route to a router.

53. (Previously presented) A computer-readable medium as recited in claim 52, further comprising computer-executable instructions for causing the router to route traffic from said source to said routing destination over said lowest cost route.

54. (Previously presented) A computer-readable medium as recited in claim 51, wherein said path characteristic is selected from the group consisting of latency, packet loss, headroom, price, path length, Route-Change, and BGP reachability.

55. (Cancelled)

56. (Cancelled)

57. (Previously presented) A computer-readable medium as recited in claim 51, further comprising computer-executable instructions for inferring said path characteristic by determining a weighted average of said path characteristic from said source to other destinations based on physical proximity of said other destinations to said routing destination.

58. (Previously presented) A computer-readable medium as recited in claim 51, further comprising computer-readable instructions for:

measuring latency between said source and a plurality of other destinations;

determining physical distances between said routing destination and said other destinations;

computing a weighted average of said latency measurements as a function of said distances; and

using said weighted average as an estimate of the latency between said source and said routing destination.

59. (Currently Amended) A computer-readable medium including ~~comprising~~ computer-executable instructions for: routing traffic from a source to a routing destination in a network where a plurality of routes are available, wherein the instructions comprise:

~~for each available route from a source to a routing destination in a network where a plurality of routes are available,~~

~~(i)~~ obtaining a measurement of a path characteristic associated with routing traffic from said source to said routing destination for a first path; ~~or~~ and

~~(ii)~~ determining the location of said routing destination and inferring said path characteristic for a second route based on measurement of said path characteristic associated with sending traffic from said source to another destination ~~over said available routes~~ by:

measuring the time that it takes for traffic to move from a plurality of source locations to said routing destination;

converting said times to distance equivalents;

forming a plurality of intersecting circles using said distance equivalents as the radius of circles with said source locations as the center; and

determining the physical location of said routing destination from the intersection of said circles;

using a cost function, assigning a cost to each available route as a function of the path characteristic associated with said route;

minimizing said cost function over said routes and identifying a route with the lowest cost of routing said traffic as defined by said cost function; and

generating a routing table containing said lowest cost route.

60. (Previously presented) A computer-readable medium as recited in claim 59, further comprising computer-executable instructions for propagating the routing table to a router.

61. (Previously presented) A computer-readable medium as recited in claim 60, further comprising computer-executable instructions for causing the router to apply said routing table to said routes.

62. (Previously presented) A computer-readable medium as recited in claim 59, wherein said path characteristic is selected from the group consisting of latency, packet loss, headroom, price, path length, Route-Change, and BGP reachability.

63. (Cancelled)

64. (Cancelled)

65. (Previously presented) A computer-readable medium as recited in claim 59, further comprising computer-executable instructions for inferring said path characteristic by determining a weighted average of said path characteristic from said source to other destinations based on physical proximity of said other destinations to said routing destination.

66. (Previously presented) A computer-readable medium as recited in claim 59, further comprising computer-executable instructions for:

measuring latency between said source and a plurality of other destinations;

determining physical distances between said routing destination and said other destinations;

computing a weighted average of said latency measurements as a function of said distances; and

using said weighted average as an estimate of the latency between said source and said routing destination.

67. (Previously presented) A method for determining a route based on measured and inferred path characteristics, comprising:

measuring a path characteristic associated with a first path between a first subnet source and a first subnet destination;

measuring a path characteristics associated with a second path between the first subnet source and a second subnet destination;

inferring a path characteristic associated with a third path between the first subnet source and a third subnet destination using a weighted average of the measured path characteristic associated with the first path and the measured path characteristic associated with the second path; and

determining a next hop subnet for each of the paths using a cost function based on the path characteristic and at least one additional path

characteristic, wherein the cost function uses a coefficient to weight the path characteristic and the at least one additional path characteristic.

68. (Previously presented) The method of Claim 67, wherein the weighted average is based on a distance between the first subnet destination and the third subnet destination and a distance between the second subnet destination and the third subnet destination.

69. (Previously presented) The method of Claim 68, wherein the distance between the first subnet destination and the third subnet destination is determined using circular intersection.

70. (Previously presented) The method of Claim 67, wherein the path characteristic is selected from the group consisting of latency, packet loss, headroom, price, path length, Route-Change and BGP reachability.

71. (Previously presented) The method of Claim 67, further comprising:

creating a routing table having a row that corresponds to the first subnet source and columns that correspond to each of the subnet destinations, wherein the routing table identifies the next hop subnet for the first subnet source and each of the subnet destinations.

72. (Previously presented) The method of Claim 67, wherein the subnet source and the net hop subnet correspond to autonomous systems.

73. (Previously presented) The method of Claim 67, wherein the subnet destination corresponds to an address prefix.

74. (Previously presented) The method of Claim 67, wherein determining a next hop subnet for each of the paths, comprises:

selecting the next hop subnet that corresponds to the path having a lowest path cost.

75. (Previously presented) A method for identifying optimized routes between a plurality of subnet sources and a plurality of subnet destinations, comprising:

for each subnet source, obtaining performance data for a plurality of possible routes between the subnet source and the subnet destinations;

selecting an initial route based on the performance data; and

optimizing the routes by:

for each subnet source, optimizing the routes from the subnet source to the subnet destinations by selecting the routes having a lowest cost using a cost function that is based on weighted path characteristics; and

for each subnet destination, optimizing the routes from the subnet sources to the subnet destination by selecting the routes having a lowest cost based on the cost function.

76. (Previously presented) The method of Claim 75, further comprising:

creating a routing table having rows that correspond to each of the subnet sources and columns that correspond to each of the subnet destinations, wherein the routing table identifies the next hop subnet for each subnet source and each subnet destination based on the optimization.

77. (Previously presented) The method of Claim 75, wherein the optimization of the routes between a selected subnet source and the subnet destinations is performed by the selected subnet source and wherein the optimization of the routes between the subnet sources and a selected subnet destination is performed centrally.

78. (Previously presented) The method of Claim 75, wherein the path characteristics are selected from the group consisting of latency, packet loss, headroom, price, path length, Route-Change and BGP reachability.

79. (Previously presented) The method of Claim 75, wherein the subnet source and the net hop subnet correspond to autonomous systems.

80. (Previously presented) The method of Claim 75, wherein the subnet destination corresponds to an address prefix.

81. (Previously presented) A method for propagating routes to a plurality of routers within an autonomous system (AS), comprising:

receiving route information from within the AS for a plurality of routes between the AS and a plurality of prefix destinations;

receiving route information from a plurality of neighboring ASs via Border Gateway Protocol (BGP);

based on the routing information from the AS and the neighboring ASs, determining a next hop AS for each of the routes between the AS and the prefix destinations; and

propagating the next hop determination to a plurality of routers within the AS.

This Page is Inserted by IFW Indexing and Scanning Operations and is not part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ BLACK BORDERS
- ☐ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☐ FADED TEXT OR DRAWING
- ☐ BLURRED OR ILLEGIBLE TEXT OR DRAWING
- ☐ SKEWED/SLANTED IMAGES
- ☐ COLOR OR BLACK AND WHITE PHOTOGRAPHS
- ☐ GRAY SCALE DOCUMENTS
- ☑ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☐ REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: _____

IMAGES ARE BEST AVAILABLE COPY.
As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.